#3

Description

Technical Field

The invention relates to the exterior wall construction of frame buildings for residences, apartments, office buildings and the like. Although but two embodiments of the present invention have been illustrated and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention.

Background of the Invention

It is common in the method and materials used to construct frame building walls, that relatively airtight cavities are created such that natural ventilation of the said cavities is prevented or seriously reduced. Since frame building walls are not absolutely watertight, the net result over time is that excess moisture (or humidity) accumulates in the cavities thereby causing mould to form and eventually causing structural damage to the wall itself. Also, present day methods and materials effectively allow these moisture related problems to go on undetected for long periods of time.

The prior art does contain modifications to the common method and materials to generally improve air circulation such as described in Canadian application no. 2,148,626 by Fitzgibbon and in U.S. patent no. 4,393,633 by Charniga. However, all of these are strictly passive arrangements that do not measure, control or manage any specific parameters whatsoever. Because of this, the net effect that the prior art systems could possibly have on any specific parameters, such as moisture content or relative humidity for instance, is unknown. Also, these systems require significant changes to the standard framing members which in turn poses a serious limitation on commercial feasibility.

The present invention is a system whereby specific parameters such as moisture content and relative humidity are measured, managed and controlled without significant changes to the standard framing arrangement.

Summary of the Invention

The invention controls moisture in frame building walls by enabling dry interior air to pass through the wall cavity by means of a forced ventilation system that is controlled by a moisture control mechanism connected to moisture probes installed in the said cavity and which exhausts this air to the exterior. The system operates on demand such that when the probes detect that the moisture content or humidity in the cavity exceeds predetermined values, the control mechanism activates a fan which continues to operate until such time as the predetermined values are reached and upon reaching same, the mechanism then shuts off the fan. The air circulation is achieved by connecting the fan works to a series of specifically designed hollow headers and exhaust ports which form part of the wall itself but do not require significant changes to the standard framing arrangement of a conventional building wall.

Brief Description of the Drawings

Figure 1 is a plan view showing a typical general arrangement of the present invention in a new construction application.

Figure 2 is a section view of the system of Figure 1.

Figure 3 is an enlarged detailed portion of Figure 2.

Figure 4 is a plan view showing a typical general arrangement of the present invention in a retrofit application.

Figure 5 is a section view of the system of Figure 4.

Figure 6 is an enlarged detailed portion of Figure 5.

Detailed Description

Referring to Figures 1, 2 and 3, it can be seen that a typical new construction general arrangement is disclosed. A standard exterior load bearing wall is comprised of an exterior wall portion 1, an interior wall portion 2, a perforated hollow top plate header 3, a perforated hollow bottom plate header 4 and in the cavity thus defined, is found insulation 5, insulation spacers 6 and moisture/humidity probes 7. When the probes detect that the moisture or humidity in the cavity exceeds predetermined values, a moisture control mechanism 8 activates a fan 9 which draws dry interior air 10 and forces it through a connector pipe 11 and the components of the stud space defined above. The air is allowed to escape to the exterior by means of exhaust ports 12 located at the ends of the top plate header 3. Once the predetermined moisture/humidity values have been reached, the mechanism 8 shuts off the fan 9. In this way, the invention is able to keep the moisture/humidity levels in the cavity below acceptable levels thereby preventing mould growth and the structural damage associated with same.

Referring to Figures 4, 5 and 6, it can be seen that a typical retrofit general arrangement of the present invention is disclosed. This arrangement is essentially the same as the one described above except that the hollow top plate header 3 and the hollow bottom plate header 4, are constructed by cutting open and expanding inward the interior wall portion 2. Also shown is a different configuration for the insulation spacers 6, which, if used, may require a slightly higher capacity fan 9 to overcome the small increase in friction head loss at the interface of the insulation 5 and the inboard edges of the interior and exterior wall portions. With these changes and the same previously described control arrangement, this retrofit application can achieve the same objective of keeping the moisture/humidity levels in the cavity below acceptable levels thereby preventing mould growth and the structural damage associated with same.

Also, for both of the applications described above, the frequent automatic operation of the system can act as an early warning that possible water related breaches or defects in the wall have occurred at specific locations. This can enable the owner(s) to take corrective action in a timely manner thereby preventing damage that might otherwise grow out of control if left undetected.